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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,910	09/12/2003	Alexander Kosyachkov	SMBZ 2 01006	8324
27885	7590	11/23/2005	EXAMINER	
FAY, SHARPE, FAGAN, MINNICH & MCKEE, LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114			THOMPSON, CAMIE S	
			ART UNIT	PAPER NUMBER

1774

DATE MAILED: 11/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/661,910	Applicant(s) KOSYACHKOV, ALEXANDER	
	Examiner Camie S. Thompson	Art Unit 1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed September 8, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23, 25, 28-39, 41 and 44-46 is/are rejected.
- 7) ☒ Claim(s) 24, 26, 27, 40, 42 and 43 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed September 8, 2005 have been acknowledged.
2. The rejection of claims 1-7, 9-12, 14-21, 23-26, 28-37 and 39-44 under 35 U.S.C. 103(a) as being unpatentable over Cheong et al., U.S. Pre Grant Publication 2002/0122895 is withdrawn due to applicant's argument.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9, 11, 14-23, 25, 28-39, 41 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al., U.S. Patent Number 6,597,108 in view of Chatila et al., U.S. Patent Number 6,016,012

Yano discloses an electroluminescent panel that comprises a phosphor structure wherein the phosphor comprises an alkaline earth thioaluminate such as barium magnesium thioaluminate and barium thioaluminate as per instant claims 1-4, 17-18, 31-34 (see column 3, lines 20-68). Additionally, the reference discloses that the phosphor is activated by europium (see column 4, lines 1-7). The reference discloses that the El panel has the structure: a predetermined pattern of lower electrodes formed on a substrate and a first thick insulating layer (or thick-film dielectric layer) formed on the lower electrodes; a light emitting layer comprising the europium activated

Art Unit: 1774

barium thioaluminate formed on the first insulating layer; a second insulating layer, which may be silicon oxynitride) is formed on the light emitting layer; and a predetermined pattern of upper electrodes formed on the second insulating layer as per instant claims 11, 14-16, 25, 28-30, 41 and 44-46 (see column 7, line 58-column 9, line 1). Column 9, lines 6-7 of the reference discloses that the second insulating layer (silicon oxynitride) can be deposited by sputtering and has a thickness of about 50 to 1,000 nm as per instant claims 9, 23, and 39. Also, the Yano reference discloses that the phosphor thin film matrix further contains oxygen in the material. Yano does not specifically disclose a silicon oxynitride having a composition of $\text{Si}_3\text{N}_x\text{O}_y\text{H}_z$ where $2 \leq x \leq 4$, $0 < y \leq 2$ and $0 \leq z \leq 1$. Chatila discloses silicon oxynitrides as dielectric material. Additionally, the Chatila reference discloses oxynitrides of the general formula $\text{Si}_a\text{O}_x\text{N}_y$ such that $(x/2) + (3y/4) = a$ (which is the equivalent of applicant's silicon oxynitride when $z=0$). The silicon oxynitride of the Yano reference is close in structural similarity to the instant silicon oxynitride composition of the Chatila reference that discloses silicon oxynitrides as dielectric materials that it would be obvious to one of ordinary skill in the art that the silicon oxynitride composition of the Yano reference have similar properties of the instant silicon oxynitride composition *in re Payne*, 606 F. 2d 303, 313, 203 USPQ 245, 254 (CCPA 1979). Additionally, the Yano reference does not disclose the ratio of the atomic concentration of magnesium to barium for a magnesium barium thioaluminate phosphor or the atomic ratio of europium to barium or barium plus magnesium as per the instant claims. However, this is an optimizable feature. The amount of magnesium to barium and europium present in the phosphor affect the luminescence and stability of the device. Discovery of optimum values of a result effective variable involves only routine skill in the art *in re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA

Art Unit: 1774

1980). Therefore, it would have been obvious to one of ordinary skill in the art to have the ratio of the atomic concentration of magnesium to barium plus magnesium in the range of 0.001 to 0.2 and the atomic ratio of the europium to barium or barium plus magnesium in the range of about 0.005 to about 0.04 in order to have an EL panel that has increased luminescence.

5. Claims 1, 9-10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukami et al., U.S. Patent Number 4,188,565 in view of Chatila et al., U.S. Patent Number 6,016,012.

Muzukami discloses at least one silicon oxynitride film that is deposited on an electroluminescence layer made of ZnS thin film doped with manganese (see column 2, lines 45-64). Figure 2 of the Muzukami reference discloses that an electroluminescent layer of ZnS:Mn is sandwiched between two layers of silicon oxynitride films with a thickness of 0.1-10 μm (see column 4, lines 21-61). The Muzukami reference does not specifically disclose a silicon oxynitride having a composition of $\text{Si}_3\text{N}_x\text{O}_y\text{H}_z$ where $2 \leq x \leq 4$, $0 < y \leq 2$ and $0 \leq z \leq 1$. Chatila discloses silicon oxynitrides as dielectric material. Additionally, the Chatila reference discloses oxynitrides of the general formula $\text{Si}_a\text{O}_x\text{N}_y$ such that $(x/2) + (3y/4) = a$ (which is the equivalent of applicant's silicon oxynitride when $z=0$). The silicon oxynitride of the Muzakami reference is close in structural similarity to the instant silicon oxynitride composition of the Chatila reference that discloses silicon oxynitrides as dielectric materials that it would be obvious to one of ordinary skill in the art that the silicon oxynitride composition of the Yano reference have similar properties of the instant silicon oxynitride composition *in re Payne*, 606 F. 2d 303, 313, 203 USPQ 245, 254 (CCPA 1979).

Art Unit: 1774

6. Claims 24, 26-27, 40 and 42-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not provide for the recited thick film dielectric electroluminescent device and phosphor thin film laminate, further including a silicon oxynitride layer on the top and bottom of the phosphor thin film layer. Additionally, the prior art does not provide the recited thick film dielectric electroluminescent device and phosphor thin film laminate, further including a composite material comprising two or more silicon oxynitride compositions having different values of x, y and z.


Response to Arguments

7. Applicant's arguments with respect to claims 1-46 have been considered but are moot in view of the new ground(s) of rejection. Applicant argues that Yano does not teach silicon oxynitride layers on both sides of the phosphor film. Applicant claims an improved phosphor structure with a silicon oxynitride layer provided on the top of the phosphor layer, as does Yano. Applicant argues that Yano fails to teach the specific ratios of elements in the claimed silicon nitride. The Chatila reference was brought in to show silicon oxynitrides that is the formula equivalent of applicant's silicon oxynitride and is used as dielectric materials. Additionally, applicant argues that the claimed silicon oxynitride provides advantages leading to minimal performance degradation of the phosphor. The silicon oxynitride layer of the Yano reference is an insulating layer to protect the phosphor layer. Also, applicant's specification does not provide a clear regard to unexpected results.

Art Unit: 1774

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L Dye, can be reached at (571) 272-3186. The fax phone number for the Group is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


RENA DYE
SUPERVISORY PATENT EXAMINER
A.U. 1774 "1/18/05"